ABSTRACT

A low temperature process for fabricating a high-performance and reliable semiconductor device in high yield, comprising forming a silicon oxide film as a gate insulator by chemical vapor deposition using TEOS as a starting material under an oxygen, ozone, or a nitrogen oxide atmosphere on a semiconductor coating having provided on an insulator substrate; and irradiating a pulsed laser beam or an intense light thereto to remove clusters of such as carbon and hydrocarbon to thereby eliminate trap centers from the silicon oxide film.

Also claimed is a process comprising implanting nitrogen ions into a silicon oxide film and annealing the film thereafter using an infrared light, to thereby obtain a silicon oxynitride film as a gate insulator having a densified film structure, a high dielectric constant, and an improved withstand voltage.